PROJECT: WBS 34820.4.3 U-2524WM

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

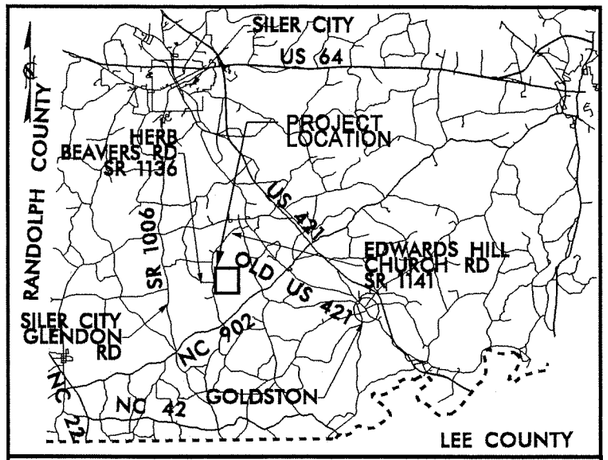
CHATHAM COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2524WM	1	12

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34820.4.1		PE
34820.4.2		R/W
34820.4.3		CONST.

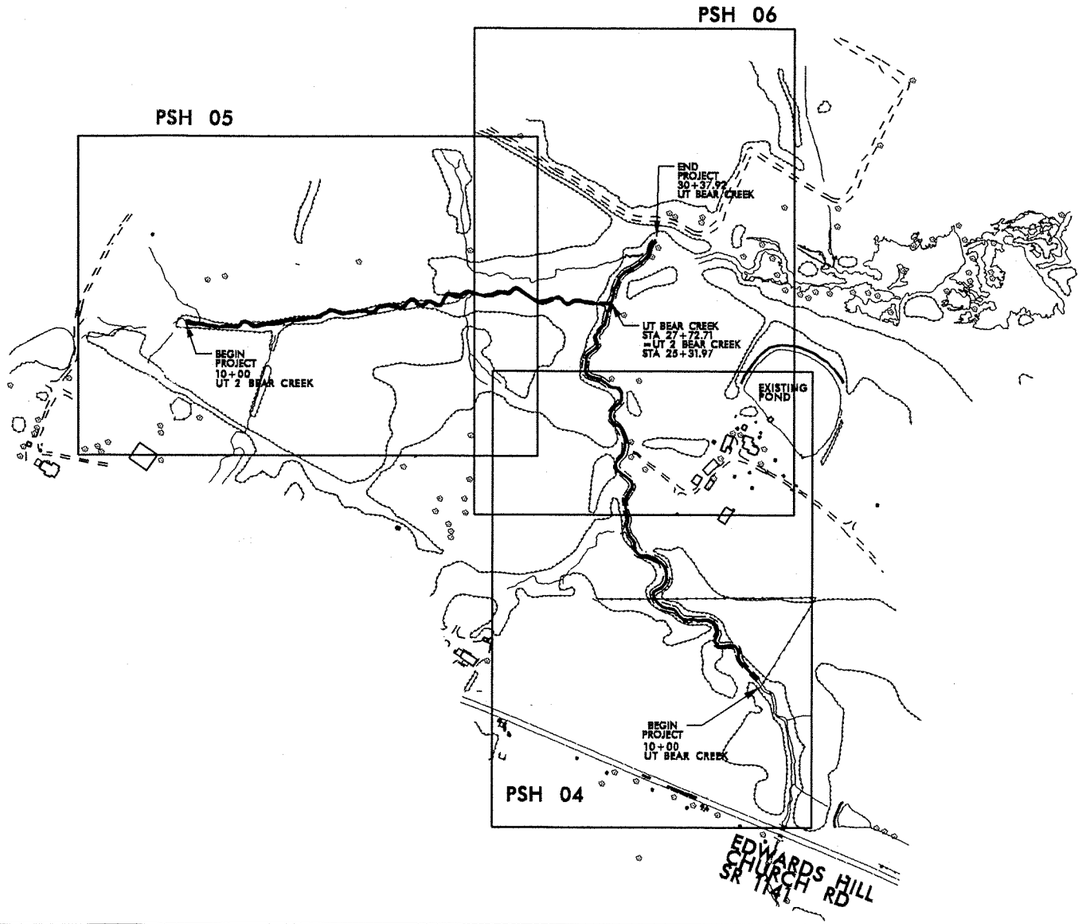
LOCATION: *UT BEAR CREEK NEAR SR 1141 AND SR 1136 (HERB BEAVERS ROAD)*

TYPE OF WORK: *STREAM MITIGATION*



VICINITY MAP

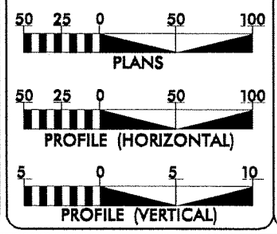
SEE SHEET 1-A FOR INDEX OF SHEETS



AS BUILT

AS BUILT
2,500 LF Restoration
1,070 LF Enhancement

GRAPHIC SCALES



DESIGN DATA

	UT BEAR CREEK	UT-2
DESIGN STREAM TYPE	C-4/C-5	C-4/C-5
DESIGN REACH LENGTH	2040	1532
BANKFULL XSEC AREA	34.6	7.2
BANKFULL WIDTH	21.3	9.8
BANKFULL DEPTH	1.7	0.9
W/D RATIO	12.2	10.8

PROJECT LENGTH

UT BEAR CREEK
EXISTING STREAM LENGTH = 1926.7 FEET
PROPOSED DESIGN STREAM LENGTH = 2017.0FEET
UT-2
EXISTING STREAM LENGTH = 1284.0 FEET
PROPOSED DESIGN STREAM LENGTH = 1532.0 FEET

NCDOT CONTACTS: BYRON MOORE, PE
PROJECT MANAGERS

PREPARED IN THE OFFICE OF:

MARCH 29, 2006
LETTING DATE:

W. HENRY WELLS, PE
PROJECT ENGINEER

PROJECT ENGINEER

P.E.
SIGNATURE

PROJECT ENGINEER

APPROVED BY:

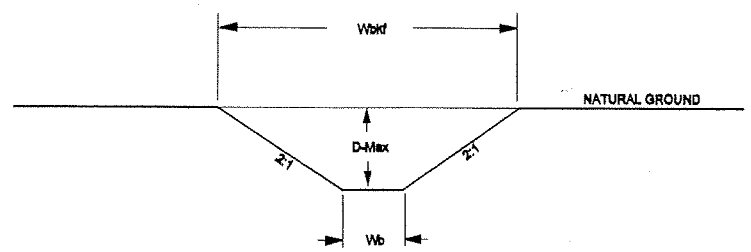
DATE:

SUNGATE DESIGN GROUP, P.A.

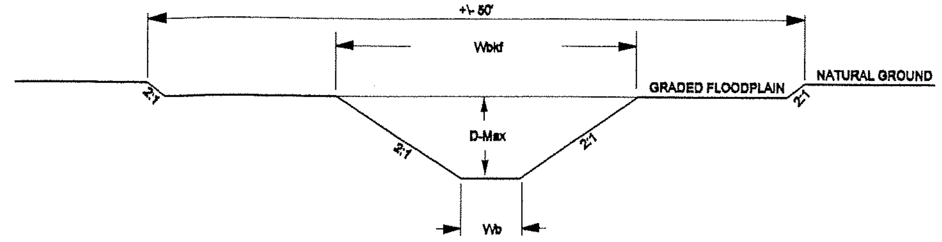
ENVIRONMENTAL SERVICES, INC.
524 NEW HOPE ROAD
RALEIGH, NORTH CAROLINA 27610
(919) 212-1760

AS BUILT

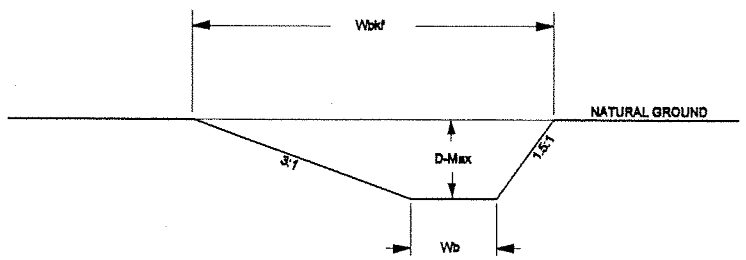
TYPICAL RIFFLE AND POOL FOR UT BEAR CREEK AND UT2 BEAR CREEK



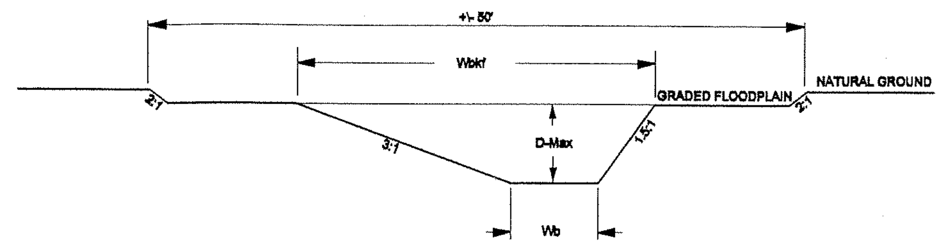
RIFFLE



RIFFLE WITH BANKFULL BENCH



POOL

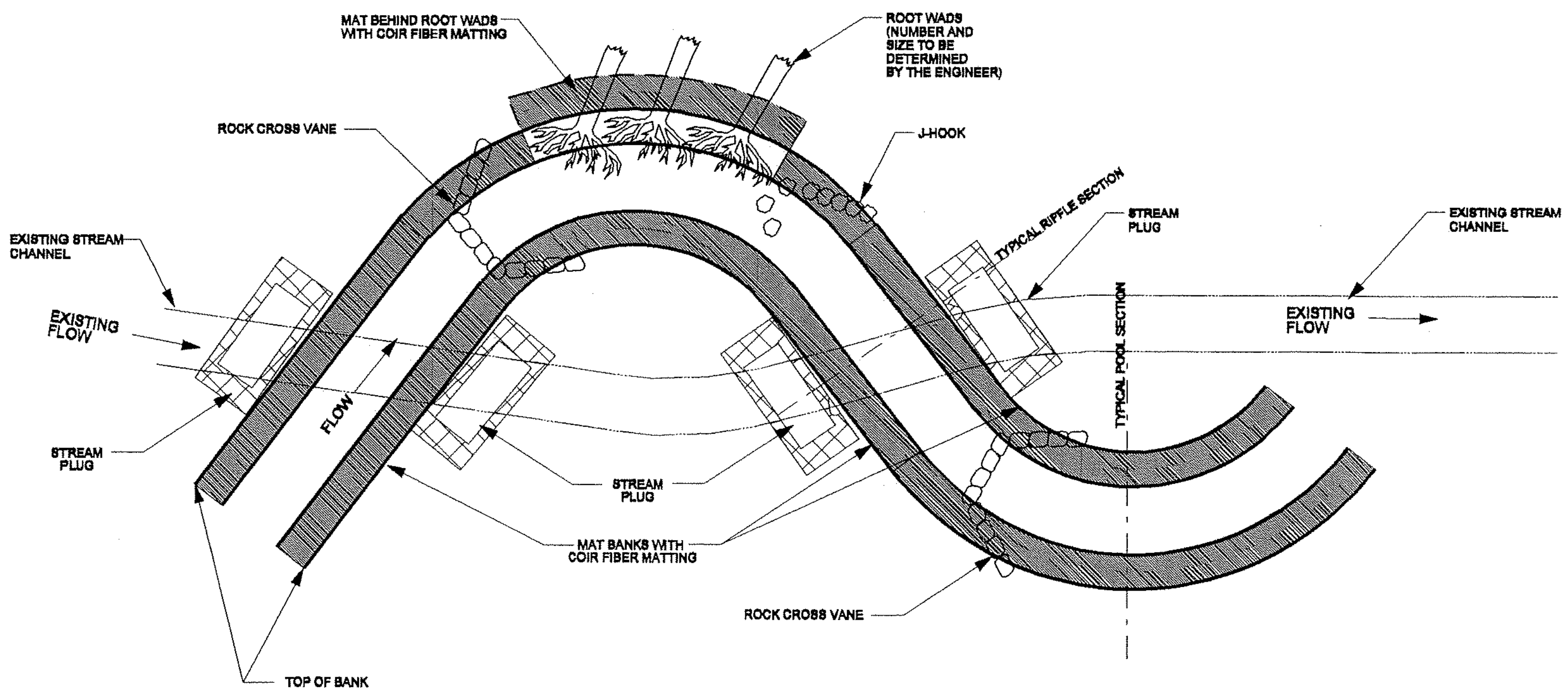


POOL WITH BANKFULL BENCH

UT BEAR CREEK		UT2 BEAR CREEK		
RIFFLE	POOL	RIFFLE	POOL	
21.3'	11-21	9.8'	5-10'	WIDTH OF BANKFULL (Wbkf)
1.7'	3.0'	0.9'	1.3'	AVERAGE DEPTH
2.0'	3.0'	1.3'	1.4-2.0'	MAXIMUM DEPTH (D-Max)
12.5	3.7-7.0	9.0	5-7.1	WIDTH TO DEPTH RATIO (bkfl W/D)
34.6 ft²	16.5-43.5 ft²	7.2 ft²	3.5-11.0 ft²	BANKFULL AREA (Abkf)
13.3'	0-7.5'	6.2'	0-1.0'	BOTTOM WIDTH (Wb)

NOTES:
1. DURING CONSTRUCTION CORNERS OF DESIGN CHANNEL WILL BE ROUNDED AND A THALWEG WILL BE SHAPED PER DIRECTION OF ENGINEER.
2. POOLS SHOWN ABOVE ARE RIGHT POOLS ONLY. REVERSE DIMENSIONS FOR LEFT TYPICAL POOL.

TYPICAL STRUCTURE PLACEMENT

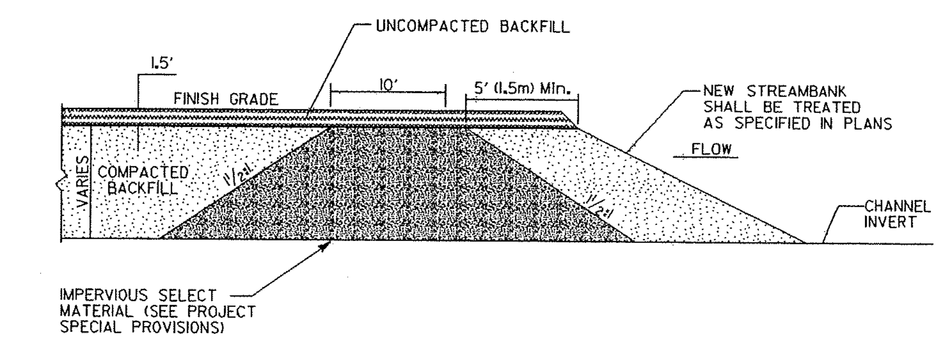


STRUCTURE NOTES:
1. GENERALLY STREAM STRUCTURES WILL BE INSTALLED IN THE LOCATION AND SEQUENCE AS SHOWN.
2. ADDITIONAL STRUCTURES OR CHANGES TO STRUCTURE LOCATIONS MAY BE MADE BY THE ENGINEER DURING CONSTRUCTION.

NOTES:
1. COIR FIBER MATTING TO BE INSTALLED ON STREAMBANK AND BEHIND ROOT WADS ON OUTSIDE OF MEANDER BENDS.
2. IF ROOT WADS DO NOT COVER ENTIRE SLOPE ON OUTSIDE OF MEANDER BENDS, COIR FIBER MATTING IS NEEDED.

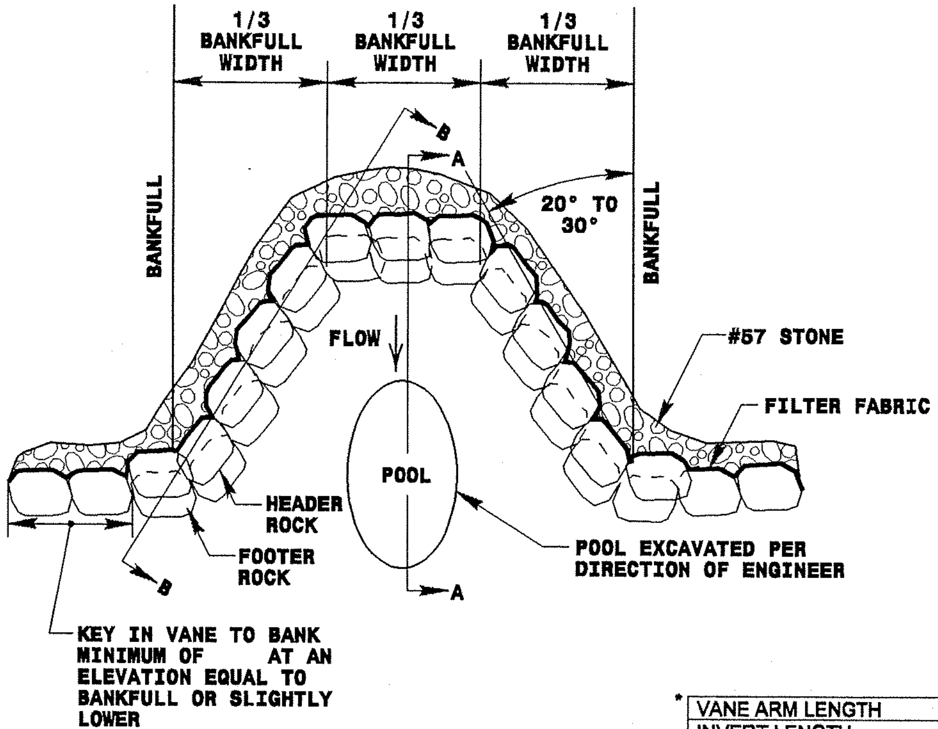
STREAM PLUG

SCALE: NTS



ROCK CROSS VANE

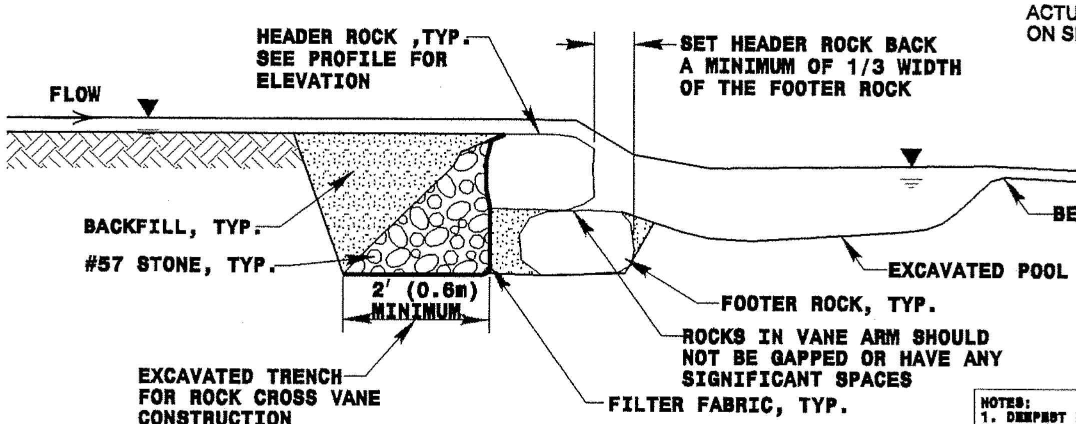
NOT TO SCALE



PLAN VIEW

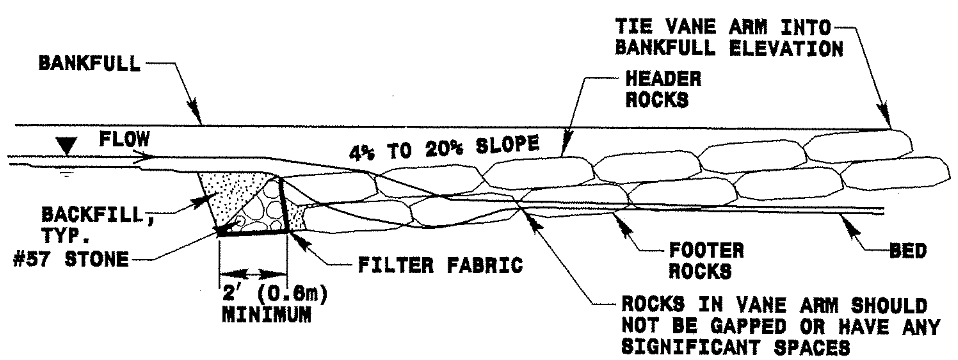
	UT Bear Creek	UT 2
* VANE ARM LENGTH	15'-25'	7'-15'
INVERT LENGTH	4.0'-5.0'	2.0'-3.0'
BANKFULL WIDTH	21.0'	10.0'
BOTTOM WIDTH	13.5'	6.0'
SILL LENGTH	5.0'-8.0'	3.0'-5.0'
ARM ANGLE	20° TO 30°	20° TO 30°
ARM SLOPE	4% - 10%	4% - 10%

* DIMENSIONS ARE GENERAL
ACTUAL DIMENSIONS DEPENDANT
ON SPECIFIC SITE CONDITIONS

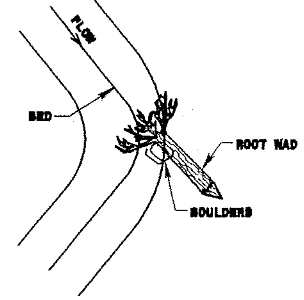


SECTION A-A

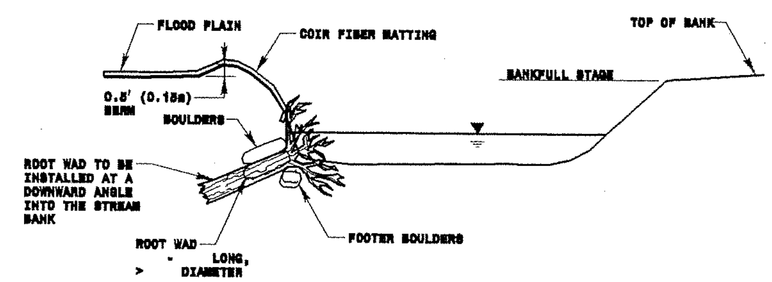
NOTES:
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
4. COMPACT BANKFULL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.
6. FOOTER AND HEADER ROCKS SHOULD BE NATIVE QUARRIED ROCK OR LOCALLY SHOT ROCK, ANGULAR AND OBLONG WITH MINIMUM DIMENSIONS OF 4.0'x3.0'x2.0'.
7. ROCKS SHOULD FIT WITH MINIMAL SPACES.



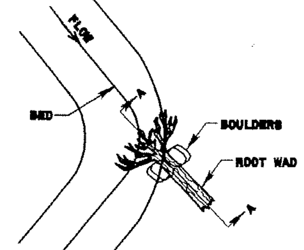
SECTION B-B



PLAN VIEW DRIVE POINT METHOD



SECTION A-A



PLAN VIEW TRENCHING METHOD

NOTES:

ORIENT ROOT WADS SO THAT THE STREAM FLOW MEETS THE ROOT WAD STRAIGHT ON, DEFLECTING THE WATER AWAY FROM THE BANK.

METHODS OF INSTALLATION:

DRIVE POINT METHOD:

SHARPEN THE END OF THE LOG BEFORE "DRIVING" AT A DOWNWARD ANGLE INTO THE BANK. BOULDER SHOULD BE PLACED ON EACH SIDE OF THE ROOT WAD TO PIN IT IN PLACE. THE BOULDERS SHALL BE APPROXIMATELY X X . ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

TRENCHING METHOD:

IF THE ROOT WAD CANNOT BE DRIVEN INTO THE BANK OR THE BANK NEEDS TO BE RECONSTRUCTED, THE TRENCHING METHOD SHOULD BE USED. THIS METHOD REQUIRES THAT A TRENCH BE EXCAVATED FOR THE LOG PORTION OF THE ROOT WAD. IN THIS CASE, FOOTER BOUDERS SHOULD BE INSTALLED UNDERNEATH THE ROOT WAD IN A TRENCH EXCAVATED PARALLEL TO THE BANK AND WELL BELOW THE STREAM BED. BOULDERS SHOULD BE PLACED ON EACH SIDE OF THE ROOTWAD TO PIN IT IN PLACE. THE BOULDERS SHOULD BE APPROXIMATELY X X . ONE-THIRD OF THE ROOT WAD SHOULD REMAIN BELOW NORMAL BASE FLOW CONDITIONS.

ROOT WAD DETAIL

NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2-A

PROJECT ENGINEER

APPROVED BY:

DATE:

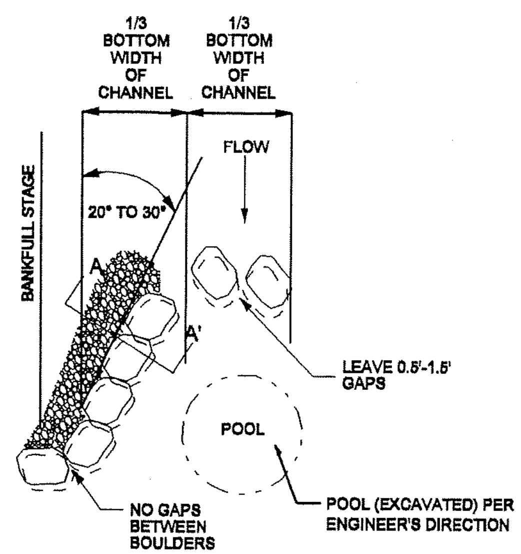
SUNGATE DESIGN GROUP, P.A.
915 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606

ENVIRONMENTAL SERVICES, INC.
524 NEW HOPE ROAD
RALEIGH, NORTH CAROLINA 27610
(919) 212-1760

AS BUILT

"J" HOOK VANE

SCALE: NTS

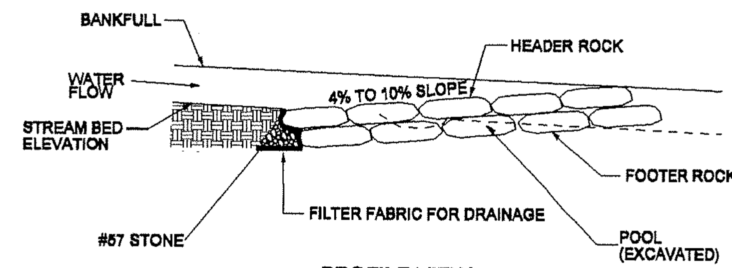


PLAN VIEW

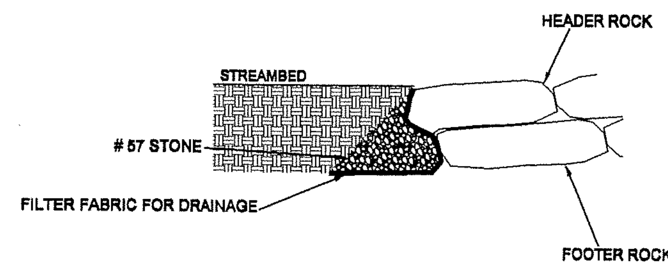
NOTE

FOOTER AND HEADER ROCKS SHOULD BE NATIVE QUARRIED ROCK OR LOCALLY SHOT ROCK, ANGULAR AND OBLONG WITH MINIMUM DIMENSIONS OF 4.0' X 3.0' X 2.0'.

ROCKS SHOULD FIT WITH MINIMAL SPACES



PROFILE VIEW



SECTION A-A'

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2-B

PROJECT ENGINEER

APPROVED BY:

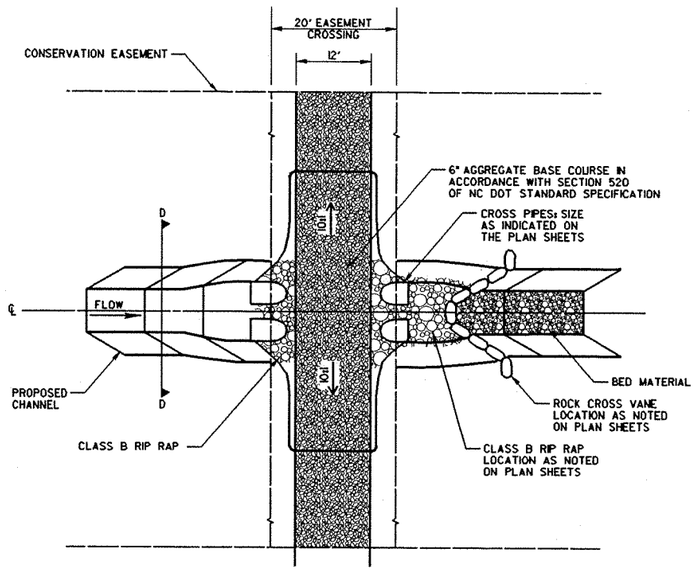
DATE:

SUNGATE DESIGN GROUP, P.A.
ENVIRONMENTAL SERVICES, INC.
824 NEW HOPE ROAD
RALEIGH, NORTH CAROLINA 27610
(919) 212-1760

AS BUILT

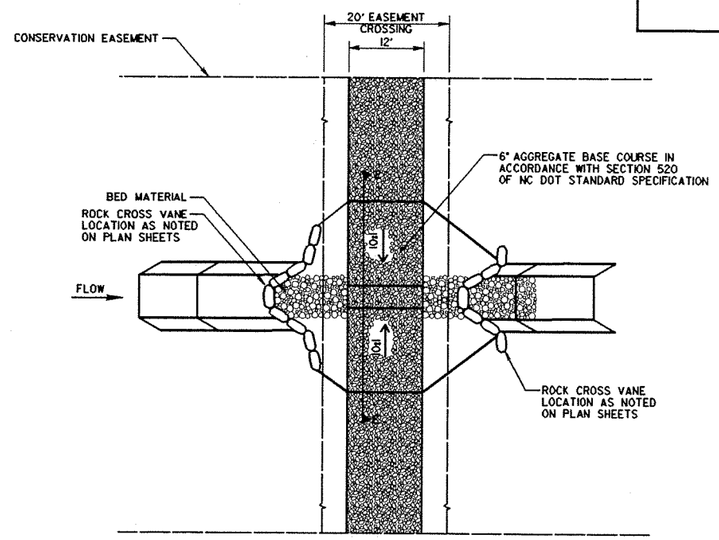
CATTLE AND EQUIPMENT STREAM CROSSING

STREAM CROSSING WITH PIPE(S)

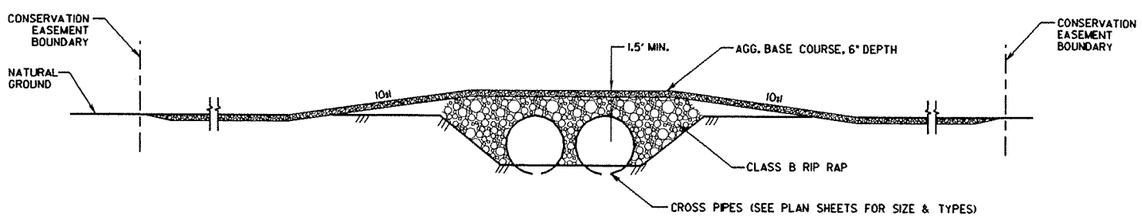


STREAM CROSSING - TYPE I
PLAN VIEW
NOT TO SCALE

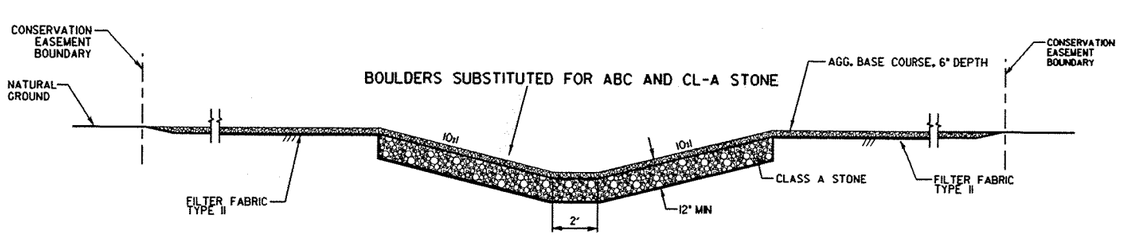
STREAM CROSSING WITHOUT PIPE(S)



STREAM CROSSING - TYPE II
PLAN VIEW
NOT TO SCALE



STREAM CROSSING - TYPE I
SECTION D-D
NOT TO SCALE



STREAM CROSSING - TYPE II
SECTION E-E
NOT TO SCALE

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	2-C

PROJECT ENGINEER

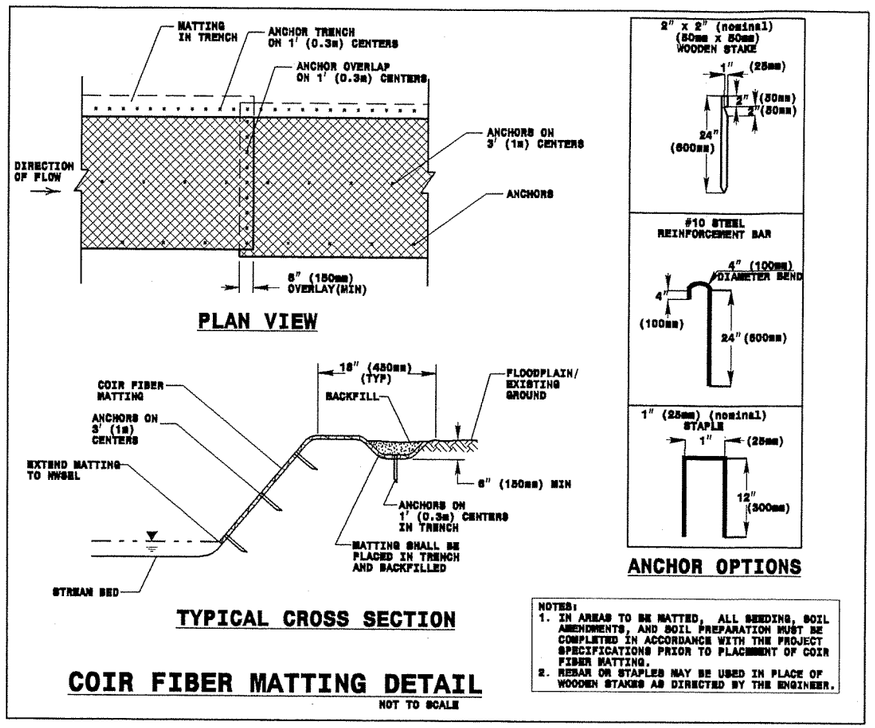
APPROVED BY:

DATE:

SUNGATE DESIGN GROUP, P.A.

ENVIRONMENTAL SERVICES, INC.
814 NEW HOPE ROAD
(919) 212-1700 NORTH CAROLINA 27610

AS BUILT

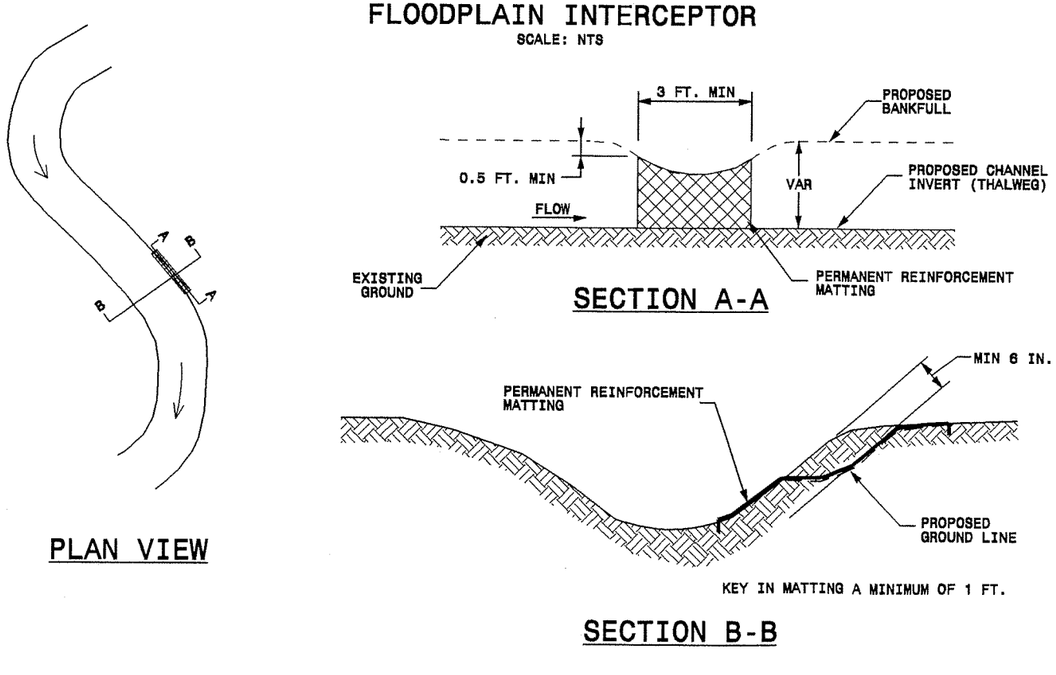


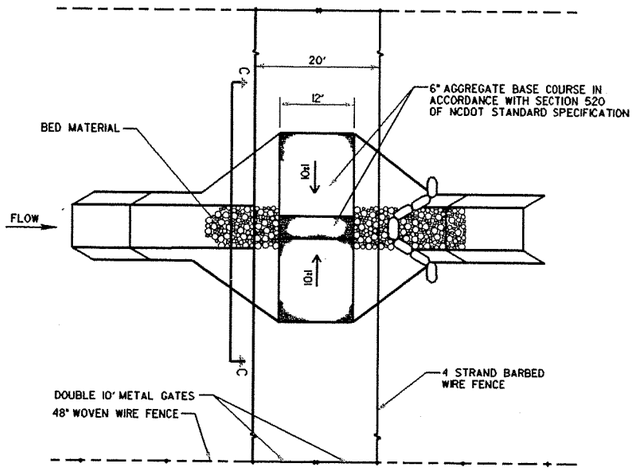
COIR FIBER MATTING DETAIL

NOT TO SCALE

FLOODPLAIN INTERCEPTOR

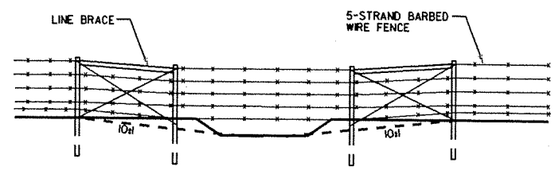
SCALE: NTS





STREAM CROSSING
PLAN VIEW

NOT TO SCALE



NOTE:

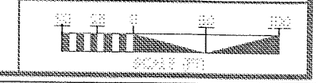
THE TWO LOWEST STRANDS OVER THE CHANNEL SHALL TERMINATE AT ONE OF THE ADJACENT POSTS AND BE SECURED TO THAT POST SUCH THAT FLOATING DEBRIS WOULD DISLODGE THE WIRE WITHOUT DAMAGING THE REMAINING FENCE.

STREAM CROSSING
SECTION C-C

NOT TO SCALE

U-2524NM	As B-3
	APPROVED BY:
	DATE:
ENVIRONMENTAL SERVICES, INC.	

EXISTING CONDITIONS
AND PROPOSED STREAM DESIGN



JENNIE B. STEWART
PIN NUM: 8667859005
DEED BOOK 764 PAGE 0582

EDWARDS HILL CHURCH ROAD SR 1141
PUBLIC R/W

JENNIE B. STEWART
PIN NUM: 8667859005
ED BOOK 764 PAGE 0582

R. D. LEE FARMS, INC.
PIN NUM: 8677034630
DEED BOOK 595 PAGE 463

R. D. LEE FARMS, INC.
PIN NUM: 8677098896
DEED BOOK 456 PAGE 546

UT STA 22+00 MATCHLINE SEE SHEET 6

**AS-BUILT

PROPOSED CENTERLINE

BEGIN PROJECT
UT BEAR CREEK
STA 10+00
N 677,640.2095
E 1,870,810.0922

TEMP. STOCKPILE AREA

TEMP. ACCESS ROAD

PERMANENT STREAM CROSSING
1 @ 36" RCP

PERMANENT 24' DRIVEWAY PIPE

2 @ 10' ACCESS GATE
SEE STD. DETAIL 866.04

10' ACCESS GAT TO BE REMOVED AND REPLACED
SEE STD. DETAIL 866.04

6' ACCESS GATE
SEE STD. DETAIL 866.04

CONTROL ACCESS FENCE
SEE STD. DETAIL 866.04

AREA BETWEEN EASEMENT AND CONTROL ACCESS FENCING IS NOT TO BE DISTURBED

RETAIN EXISTING FENCE

REMOVE EXISTING FENCE

REMOVE EXISTING FENCE (CA TO CA)

REMOVE EXISTING FENCE (CA TO B)

REMOVE EXISTING FENCE (INSIDE EASEMENT)

RESET EXISTING FENCE ALONG EASEMENT

REMOVE EXISTING FENCE AND INSTALL ACCESS GATE
SEE STD. DETAIL 866.04

STREAM CROSSING FENCE
SEE DETAIL SHEET 2C

STREAM CROSSING
TYPE 3 @ 24" RCP
SEE DETAIL SHEET 2B

CROSS VANE
STA. 19+58
**ELEV. =465.89

CROSS VANE
**ELEV. =467.4

CROSS VANE
STA. 16+35
**ELEV. =463.64

CROSS VANE
STA. 11+80
**ELEV. =467.43

CROSS VANE
STA. 21+20
**ELEV. =464.48

DELETED CROSS VANE DUE TO BEDROCK

ROOT WADS

SLOPE STAKE

J-HOOK

SAFETY FENCE

EXTG WATER VALVE

EXTG FEEDER

TEMPORARY CONSTRUCTION EASEMENT

AREA IN TEMPORARY CONSTRUCTION EASEMENT
9.631 ACRES
27,487 SQ. FT.

AREA IN INGRESS EGRESS EASEMENT
0.898 ACRES
4,288 SQ. FT.

EXISTING UT BEAR CREEK CHANNEL

RETAIN EXISTING FENCE

CONTROL ACCESS FENCE
SEE STD. DETAIL 866.04

TEMPORARY CONSTRUCTION EASEMENT

INGRESS EGRESS EASEMENT

PROPOSED CENTERLINE

RAILROAD SPIKE
IBM
0.18' GUM
82.87' TO SET

N88°11'47"W 435.15'

S04°21'06"E 48.23'

S17°64'29"W 96.43'

S29°44'51"E 592.87'

S29°45'58"E 285.09'

N88°14'45"W 96.43'

N05°25'18"W 96.43'

N88°14'45"W 230.41'

S19°BA'0"W 346.20'

U-2524WM	As B-4

APPROVED BY:

DATE:

ENVIRONMENTAL SERVICES, INC.

CHANNEL WORK DELETED

R. D. LEE FARMS, INC.
PIN NUM. 8677058996
DEED BOOK 458 PAGE 546

BEGIN PROJECT
UT-2 BEAR CREEK
STA. 10+00
N 679,853.2065
E 1,870,588.5615

CROSS VANE
STA. 10+11.5
ELEV. = 473.8

**DELETED CROSS VANES

PROPOSED CENTERLINE

CROSS VANE
STA. 11+90
ELEV. = 470.8

**DELETED CROSS VANE
STA 13+70

STREAM CROSSING
TYPE II

**DELETED CROSS VANE
STA 17+77

**DELETED STREAM CROSSING
18" CSP

CROSS VANE
STA 20+70.00
**ELEV. = 467.00

**DELETED CROSS VANE
STA 20+26.35

STREAM CROSSING
TYPE 1-2 @ 18" RCP
SEE DETAIL SHEET 2B

TEMPORARY STREAM CROSSING
4" CSP

6' ACCESS GATE
SEE STD. DETAIL 866.04

2@10' ACCESS GATE
SEE STD. DETAIL 866.04

CONTROL ACCESS FENCE
SEE STD. DETAIL 866.04

SAFETY FENCE

TEMP ACCESS ROAD

STREAM CROSSING FENCE
SEE DETAIL SHEET 2C

SLOPE STAKE

BETTY McMASTERS
PIN NUM. 8677000

**AS-BUILT

EXISTING CONDITIONS
AND PROPOSED STREAM DESIGN

MATCHLINE SEE SHEET 6

UT-2 STA 21+00

UT-2 STA 21+00 MATCHLINE SEE SHEET 5

UT-2 STA 22+00 MATCHLINE SEE SHEET 4

RESET EXISTING 12' ACCESS GATE SEE STD. DETAIL 866.04

EXISTING UT-2 BEAR CREEK CHANNEL

TEMP ACCESS ROAD

CONTROL ACCESS FENCE SEE STD. DETAIL 866.04

SEE STD. DETAIL 866.04

RETAIN EXISTING FENCE

PROPOSED CENTERLINE

STREAM CROSSING TYPE II

ROOT WADS

J-HOOK **ELEV. TOP 466.40

ROOT WADS

EXISTING UT-2 BEAR CREEK CHANNEL

CONSERVATION EASEMENT

STAKE

SILTFE STAKE

J-HOOK

CROSS VANE STA 23+45 **ELEV. = 463.83

CROSS VANE STA. 23+35 **ELEV. = 463.38

SAFETY FENCE

ACCESS GATE SEE STD. DETAIL 866.04

20'10' ACCESS GATE SEE STD. DETAIL 866.04

RADIUS ADJUSTED TO AVOID TREES

TEMP ACCESS ROAD

ARMOR W/ CLASS 'B' RIP RAP

CROSS VANE STA 22+66.00 **ELEV. = 464.85

REVISED CHANNEL

CROSS VANE STA 24+48 **ELEV. = 463.58

CROSS VANE STA 24+63.5 **ELEV. = 462.73

CROSS VANE STA 24+98 **ELEV. = 462.33

6' ACCESS GATE SEE STD. DETAIL 866.04

END UT-2/ BEAR CREEK UT STA 27+72.71 = UT-2 STA 33+31.97 N 678,680.9468 E 1,871,344.7486

CONTROL ACCESS FENCE SEE STD. DETAIL 866.04

SLOPE STAKE

PROPOSED CENTERLINE

CA FENCE TO BE 8-STRAND BARB WIRE STD.

R. D. LEE FARMS, INC. PIN NUM 5677058896 DEED BOOK 496 PAGE 546

AREA TO BE PLACED IN CONSERVATION EASEMENT 2.88 AC. +/-

END PROJECT UT BEAR CREEK STA 30+37.92 N 678,653.6388 E 1,871,894.0445

RETAIN EXISTING FENCE

TEMP ACCESS ROAD

470

475

465

480

U-2524WM | As B-5

APPROVED BY:

DATE:

ENVIRONMENTAL SERVICES, INC.

**AS-BUILT

EXISTING CONDITIONS AND PROPOSED STREAM DESIGN

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	As B-6

PROJECT ENGINEER

APPROVED BY:

DATE:

SUNGATE DESIGN GROUP, P.A.

ENVIRONMENTAL SERVICES, INC.
834 NEW HOPE ROAD
RALEIGH, NORTH CAROLINA 27610
(919) 832-1760

NORTH SIDE OF PROJECT SCREEN PLANTING
SEE REFORESTATION DETAIL SHEET FOR
MIXTURE TYPE

UT STA 22+00 MATCHLINE SEE SHEET 6

10' ACCESS GAT TO BE REMOVED AND REPLACED SEE STD. DETAIL 866.04

CONTROL ACCESS FENCE SEE STD. DETAIL 866.04

REMOVE EXISTING FENCE

6' ACCESS GATE SEE STD. DETAIL 866.04

2 @ 10' ACCESS GATE SEE STD. DETAIL 866.04

CONTROL ACCESS FENCE SEE STD. DETAIL 866.04

RETAIN EXISTING FENCE

RETAIN EXISTING FENCE

RETAIN EXISTING FENCE

RETAIN EXISTING FENCE

2@10' ACCESS GATE SEE STD. DETAIL 866.04

STREAM CROSSING FENCE SEE DETAIL SHEET 2C

6' ACCESS GATE SEE STD. DETAIL 866.04

2@10' ACCESS GATE SEE STD. DETAIL 866.04

REMOVE EXISTING FENCE INSIDE EASEMENT

RESET EXISTING FENCE ALONG EASEMENT

SAFETY FENCE

6' ACCESS GATE SEE STD. DETAIL 866.04

REMOVE EXISTING FENCE (CA TO CA)

REMOVE EXISTING FENCE AND INSTALL ACCESS GATE SEE STD. DETAIL 866.04

REMOVE EXISTING FENCE (CA TO CA)

CONTROL ACCESS FENCE SEE STD. DETAIL 866.04

REMOVE EXISTING FENCE (CA TO E)

**AS-BUILT

TYPE I STREAMBANK REFORESTATION
SEE REFORESTATION DETAIL SHEET 1

TYPE II STREAMBANK REFORESTATION
SEE REFORESTATION DETAIL SHEET 1

STREAMBANK REFORESTATION

50 25 0 50 100
SCALE (FT)

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	As B-7

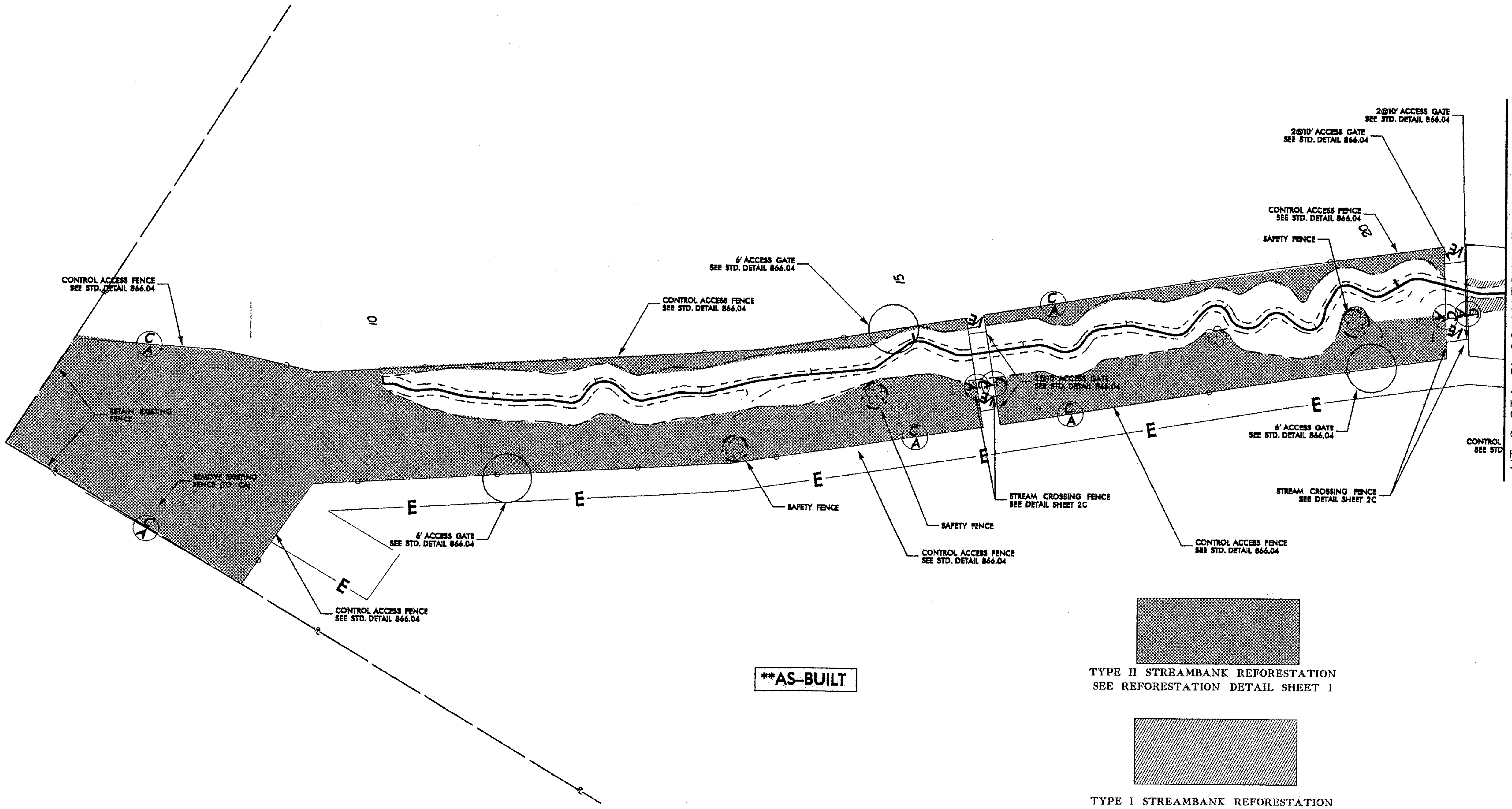
PROJECT ENGINEER

APPROVED BY:

DATE:

SUNGATE DESIGN GROUP, P.A.

ENVIRONMENTAL SERVICES, INC.
524 NEW HOPE ROAD
RALEIGH, NORTH CAROLINA 27610
(919) 212-1760



**AS-BUILT

TYPE II STREAMBANK REFORESTATION
SEE REFORESTATION DETAIL SHEET 1

TYPE I STREAMBANK REFORESTATION
SEE REFORESTATION DETAIL SHEET 1

STREAMBANK REFORESTATION

50 25 0 50 100
SCALE (FT)

PROJECT REFERENCE NO.	SHEET NO.
U-2524WM	As B-8

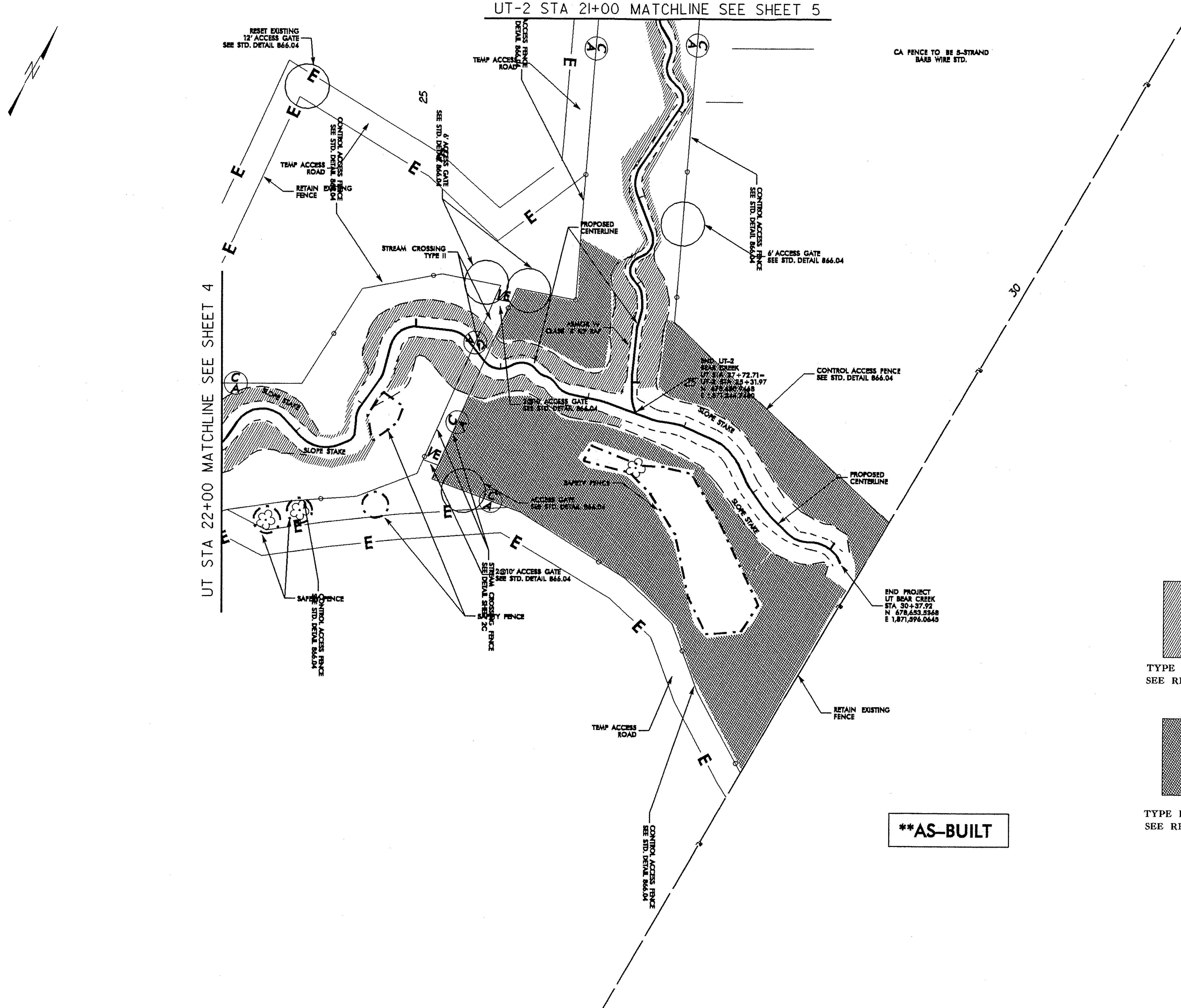
PROJECT ENGINEER

APPROVED BY:

DATE:

SUNGATE DESIGN GROUP, P.A.

ENVIRONMENTAL SERVICES, INC.



**AS-BUILT

TYPE I STREAMBANK REFORESTATION
SEE REFORESTATION DETAIL SHEET 1

TYPE II STREAMBANK REFORESTATION
SEE REFORESTATION DETAIL SHEET 1

STREAMBANK REFORESTATION

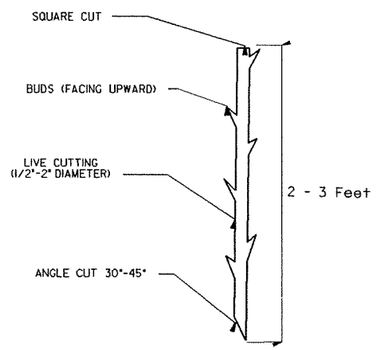
50 25 0 50 100
SCALE (FT)

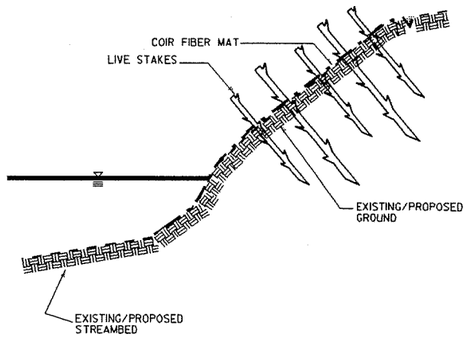
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2524WM	RF-1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
		AS BUILT	

PLANTING DETAILS

LIVE STAKES PLANTING DETAIL

LIVE STAKE

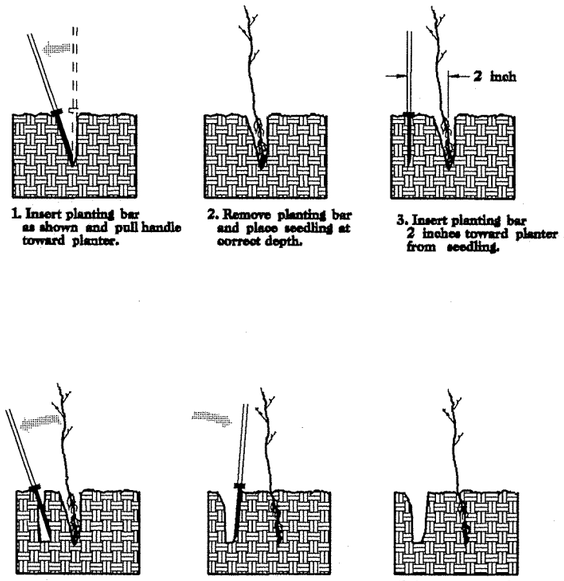




BANK STABILIZATION WITH LIVE STAKES

NOTE:
LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY 3/4 OF LIVE STAKE IS WITHIN GROUND

BAREROOT PLANTING DETAIL
DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR



1. Insert planting bar as shown and pull handle toward planter.
2. Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter, firming soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist canvas bag or similar container to prevent the root systems from drying.

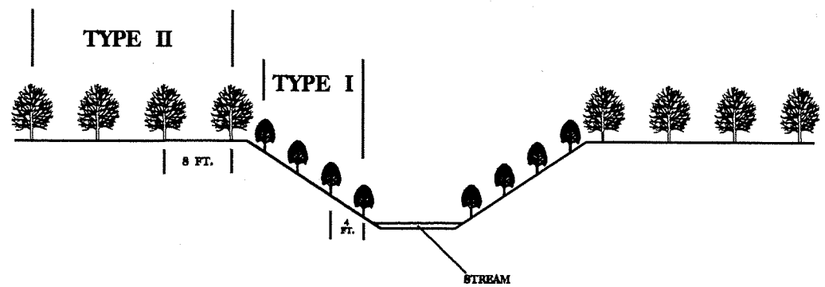
KBC PLANTING BAR
Planting bar shall have a blade with a triangular cross section, and shall be 12 inches long, 4 inches wide and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

☐ TYPE 1 STREAMBANK REFORESTATION SHALL BE PLANTED 3 FT. TO 5 FT. ON CENTER, RANDOM SPACING, AVERAGING 4 FT. ON CENTER, APPROXIMATELY 2724 PLANTS PER ACRE.

☐ TYPE 2 STREAMBANK REFORESTATION SHALL BE PLANTED 6 FT. TO 10 FT. ON CENTER, RANDOM SPACING, AVERAGING 8 FT. ON CENTER, APPROXIMATELY 680 PLANTS PER ACRE.

STREAMBANK REFORESTATION TYPICAL



STREAMBANK REFORESTATION

MIXTURE, TYPE, SIZE, AND FURNISH SHALL CONFORM TO THE FOLLOWING:

TYPE 1			
50%	SALIX NIGRA	BLACK WILLOW	2 ft – 3 ft LIVE STAKES
50%	CORNUS AMOMUM	SILKY DOGWOOD	2 ft – 3 ft LIVE STAKES
TYPE 2			
20%	QUERCUS MICHAUXII	SWAMP CHESTNUT OAK	12 in – 18 in BR
20%	QUERCUS PHELLOS	WILLOW OAK	12 in – 18 in BR
20%	FRAXINUS PENNSYLVANICA	GREEN ASH	12 in – 18 in BR
20%	PLATANUS OCCIDENTALIS	SYCAMORE	12 in – 18 in BR
20%	NYSSA SYLVATICA	BLACK GUM	12 in – 18 in BR

☐ SEE PLAN SHEETS FOR AREAS TO BE PLANTED

SCREEN PLANTING SEE PLAN SHEET 4

50%	PINUS TAEDA	LOBLOLLY PINE
50%	JUNIPERUS VIRGINIANA	RED CEDAR

STREAMBANK REFORESTATION DETAIL SHEET

N.C.D.O.T. - ROADSIDE ENVIRONMENTAL UNIT